

# A NEW GENUS OF GORGONOPSID FROM EAST AFRICA

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(With 2 figures)

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## INTRODUCTION

In his account of the theriodonts from the Ruhuhu Valley in south-west Tanzania Huene (1950) described a somewhat poorly preserved skull of a gorgonopsid as a new species of the genus *Lycaenops*, *L. kingoriensis*. The illustrations of this form immediately recalled a much better specimen collected by the writer in 1933 (no. 42) from Stockley's (1932) site B.4 at Katumbi wawili. This site is in Stockley's so-called 'Lower bone bed' which has produced both *Endothiodon* and *Cistecephalus*, and which Charig (1963) has recommended should be called the Kawinga Formation. The site B.4 has yielded, among other things, the amphibian *Peltobatrachus pustulatus* Panchen (Panchen 1953) and the gorgonopsid *Leontocephalus intactus* Kemp (Kemp 1969).

The identification of gorgonopsid skulls is made difficult by reason of the fact that many names have been given to very poorly preserved and incomplete specimens but the fact that the specimen called *Lycaenops kingoriensis* was immediately recognizable among the writer's collection seems to establish it as a valid form. However the shape of the skull, which may be said to be triangular, is in marked contrast to the material referred to the genus *Lycaenops* where, by contrast, the skulls are comparatively narrow (e.g. *L. ornatus* Broom; *L. kingwilli*, see Sigogneau 1970). Sigogneau (1970) defines the genus *Lycaenops* as having 'Crâne étroit, museau long, plus haut que large'. Neither this author nor Watson & Romer (1956) accepted Huene's reference to the genus, the former suggesting a possible reference to the genus *Sycosaurus*, the latter to the family Gorgonopsidae but without any reference to a genus.

## DESCRIPTION

The specimen described here is most unusual in that it does not appear to have undergone any distortion. The teeth are missing, as are the quadrate complexes, and small parts have been lost by breakage but, on the whole, the

skull is exceptionally well preserved. It was prepared by means of automatic mallets before the acid techniques had been perfected.

The skull measures about 300 mm in length and about 235 mm at its broadest point and is, therefore, a moderately large form. Seen from above the

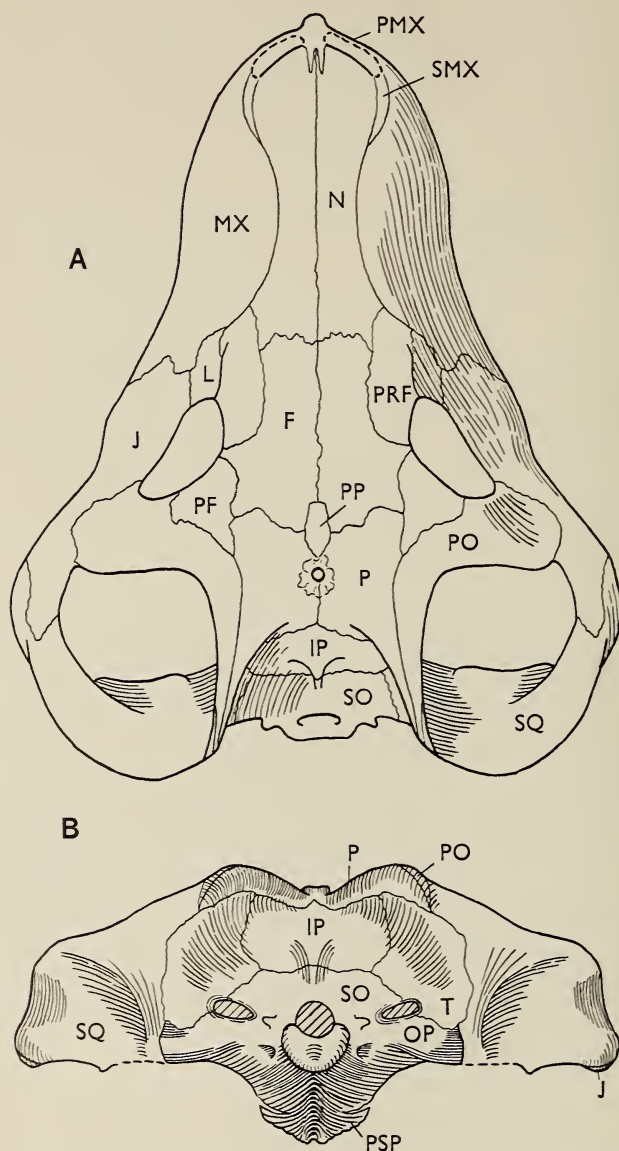


Fig. 1. A dorsal and B occipital views of *Cephalicustriodus kingoriensis* (Huene), gen. nov.  $\times \frac{1}{3}$ . F, frontal; IP, interparietal; J, jugal; L, lacrimal; MX, maxilla; N, nasal; OP, opisthotic; P, parietal; PF, postfrontal; PMX, premaxilla; PO, postorbital; PP, preparietal; PRF, prefrontal; PSP, parasphenoid; SMX, Septomaxilla; SO, supraoccipital; SQ, squamosal; T, tabular.

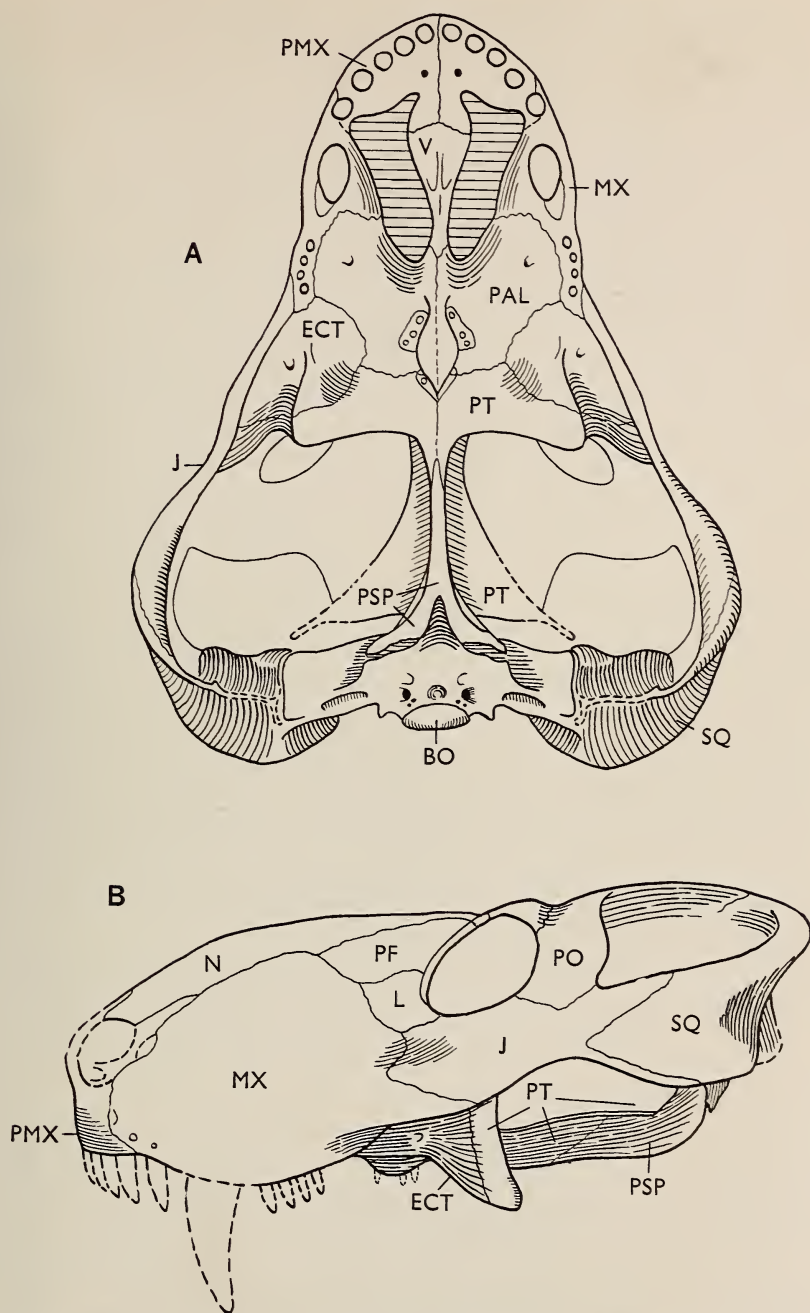


Fig. 2. A palatal and B side views of *Cephalicustriodus kingoriensis* (Huene), gen. nov.  $\times \frac{1}{3}$ . BO, basioccipital; ECT, ectopterygoid; PAL, palatine; PT, pterygoid; V, vomer; other letters as in Figure 1.

skull is markedly triangular in outline, the snout being broad, the jugals are flared out at their junction with the maxillae, and the parietal region and temporal vacuities are wide. In general the arrangement of the bones is straightforward with a moderate preparietal and the pineal surrounded by a well-developed boss. Apart from the proportions the outstanding feature lies in the nasals, coarsely sculptured bones which meet along the midline at an angle of about  $90^\circ$  for most of their length. In gorgonopsids in general (as far as is known) the snout is either rounded or flattened.

In occipital view the appearance is straightforward but the skull is very wide for its depth. The relationships of the bones are normal but it is noteworthy that the spike on the bottom of the squamosal, behind the recess for the quadrate complex, is clearly developed. This spike almost certainly fitted into a pit in the quadratojugal and helped to prevent the quadrate complex from moving too much in its recess in the squamosal (Parrington 1955).

The palate is well shown (Fig. 2A). The dentition must have been of normal gorgonopsid type there being sockets for five powerful incisors, a large canine (followed by a bony plug), and four diminutive postcanines. There are at least three small teeth on the ridge of the palatine but only one can be seen for certain on the pterygoid, this on the right side.

The fused vomers are clear and of characteristic form being expanded anteriorly but tapering posteriorly where they disappear above the palatines at about the level of the posterior borders of the internal nares. The importance of this feature, which is in contrast to the condition in *Therocephalia*, *Bauriamorpha* and *Cynodontia*, in all of which the vomers grow backwards below the palatines and pterygoids, was first recognized by Boonstra (1934) who questioned the then widely accepted view that the cynodonts were descendants of the gorgonopsids, and was the first person to do so. Subsequent work on both the early cynodonts (e.g. Broom 1938a) and gorgonopsids (Kemp 1969) have established the fact that the gorgonopsids and cynodonts are not closely related, the latter being descendants of the *Therocephalia*.

Posteriorly no interpterygoid vacuity can be detected though one might be exposed if the specimen were subjected to acid treatment. Very marked incisures are present between the wings of the parasphenoid-basisphenoid complex and the basioccipital. Taken in conjunction with the unossified zone (Olson 1944) and the frequency with which the occipital component of the brain case is found separate in synapsid reptiles, the possibility of kinetism in these forms appears to be real. Movement of the anterior region of the skull about the lateral expansions of the supraoccipitals is a possibility, but only a closely sectioned skull, when reconstructed, would establish the matter.

The form of the zygomatic arch strongly suggests that there must have been ample room for an external component of the adductor muscle mass (Fig. 2A, B). This is shown also in *Arctognathus breviceps* and the forms *Dinogorgon quinquemolaris*, where the lower jaw is present, and *Rubidgea atrox*, also with the lower jaw in place (Sigogneau 1970). The writer has suggested that a masseter muscle ran

from the anterior region of the jugal (which is deep and thickened in gorgonopsids) and the reflected lamina of the angular, thereby accounting for that peculiar structure (Parrington 1955) but Barghusen (1968) claims that only in cynodont theriodonts was this muscle evolved and Kemp (1969) has postulated in the gorgonopsids the presence of a zygomatico-mandibularis muscle between the posterior region of the arch and the reflected lamina, this in view of the special strengthening of the bone of the lamina.

Examination of Dr Sigogneau's invaluable monograph on the gorgonopsids (Sigogneau 1970), and other sources, has failed to disclose at all a close match in form with the skull from Katumbi vawili though similar broadening of the posterior region of the skull is present in a number of forms, notably *Sycosaurus*, *Prorubidgea* and *Rubidgea*, and it may well be allied to these forms. Also the meeting of the nasals at about a right angle along much of their length does not appear to have been reported elsewhere, the snout of gorgonopsids as a whole being either flattened or rounded in section.

There is some resemblance to *Gorgonops torvus* but this latter form has a proportionately much longer antorbital region and in occipital view the East African animal is much flatter.

In the new form the width across the paroccipital processes is approximately half the posterior total width, whereas in *Sycosaurus* it is distinctly more than half, in *Dinogorgon quinquemolaris* it is about three-fifths, and in *Rubidgea atrox* it is slightly less than half. Again in posterior view the depth of the occiput, taken to the bottom of the condyle, is about one-third of the total width, a character it shares only with *Rubidgea atrox*, the depth in *Dinogorgon quinquemolaris* being a little less than half and other forms being much deeper in proportion. The shape in *Rubidgea atrox* is quite different from that of the Ruhuhu specimen (Broom 1938b).

In accordance with the foregoing discussion it is proposed to erect a new genus *Cephalicustriodus*, defined principally on the triangular shape of the skull, for Huene's *Lycaenops kingoriensis* which now becomes *Cephalicustriodus kingoriensis* (Huene). It can probably best be placed in Sigogneau's (1970) subfamily Rubidgeinae. The specimen described here is catalogued number T.891 in the University Museum of Zoology, Cambridge.

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